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## GEOGRAPHICAL RECORD

### THE AMERICAN GEOGRAPHICAL SOCIETY

**Annual Report of the Society.** The annual meeting was held at the Engineering Societies' Hall, No. 29 West Thirty-ninth Street, on Tuesday evening, January 25, 1916, at 8:30 o'clock, President Greenough in the chair. The following persons recommended by the Council were elected Fellows:

Harry Calvin Berger  
Robert M. Bleakie  
Edward Andem Bryant  
F. Garcia Calderon  
Paul Chalfin  
Edward Ball Cole  
William H. Coolidge  
Clayton Sedgwick Cooper  
Alexander M. Crane  
C. T. Crocker  
Douglas Crocker  
Elliott C. Cutler

George E. Dadmun  
Timothy J. Daly  
Harold W. Dana  
Edward J. Davis  
Robert C. Davis  
J. Randall Dean  
Nevin M. Fenneman  
Armin K. Lobeck  
Thomas D. Murphy  
Andrew H. Palmer  
C. J. Posey  
Mrs. A. D. Rawson

### REPORT OF THE COUNCIL

The annual report of the Council, approved at the January meeting, was read as follows:

#### *To the Fellows of the American Geographical Society:*

In a review by the Council of the affairs of the Society for the past year the first thought is necessarily of the European War. Whatever may be the individual sympathies or leaning of any observer of the gigantic contest, he cannot fail to welcome all the information which may help in understanding the people and countries involved, or in following the military movements reported by the press. Accordingly the Society has so directed its publications, lectures, and exhibitions that they might assist its members and the public toward this desirable end; and it has been gratified at the interest displayed by a large contingent who have availed themselves of these facilities. The relations of the Society with its correspondents throughout the disturbed area of Europe have been maintained with less interruption than might have been expected, and its monthly journal presents a well-rounded chronicle of kindred associations and events.

An important and progressive change has been made in the title and scope of the Society's *Bulletin*, which will henceforth be known as *The Geographical Review*, a designation which describes more accurately its plan and contents. The January number, already issued, presents an account and an example of the publication as proposed. It is hoped that the *Review* may bring the Society in still closer touch with its members and the scientific readers whom it aims to reach, by offering an increased contribution of material maintained at the highest possible standard of scientific and literary interest. During the twelve months of 1914 there were published in the *Bulletin* forty-seven original papers by eminent authors, besides notes of geographical interest, book reviews, map notices, and bibliographical lists and indices of most comprehensive character.

The number of Fellows at the close of the year was 1,151, of whom 362 are Life Fellows, an increase of 24.

There have been added to the library and map room during the year 1,171 books, 4,960 issues of periodicals and pamphlets, 68 atlases, and 2,647 sheet maps. Important progress has been made in binding a large number of unbound publications in the library, and steps have been taken to complete the binding of all the Society's unbound collection.

Twelve meetings of the Society were held at which addresses were made by the following speakers: William Elliot Griffis, Will S. Monroe, Edgar James Banks, B. R. Baumgardt, Glen Arnold Grove, Harry Clarke Ostrander, Herbert Lawrence Bridgman, Wilfred Harvey Schoff, Henry R. Rose, and Margaret Chapman Bolles.

The Charles P. Daly gold medal of the Society was awarded to Professor Paul Vidal de la Blache and was presented to him in Paris by the American Ambassador.

The customary joint annual meeting with the Association of American Geographers was held at the Society's building on April 9 and 10. The gathering was in every way a success, showing a largely increased attendance and an improvement in the number and character of the papers presented.

Reference is made to the accompanying report of the Treasurer regarding the current revenues and expenditures during the year. The invested funds of the Society have been increased by a legacy of \$10,000 received from the executors of the late Herman C. Von Post, who was a constant friend of the Society during his life.

On July 1, Dr. Isaiah Bowman entered upon his duties as Director of the Society, and already his influence and abilities have made themselves felt.

The resources at the Society's building for study and reference are increasingly used by scholars and the public. The permanent value of timely exhibits of maps and photographs is indicated by the growth in the number of visitors to our exhibition rooms from 25,000 in 1914 to 32,800 in 1915. The number of students who have spent some time in serious study of geographical books at the Society's house has increased in the same period from 92 to 145 and the number of map consultants from 65 to 170. Nearly half of these consultants are professional geographers from colleges and universities, teachers of geography in the public schools, publishers, editors, journalists, and men of affairs. Through them we reach thousands who cannot themselves make direct use of our collections.

The staff continues zealous and efficient, and in general the condition of affairs and of the work gives cause for satisfaction.

Respectfully submitted on behalf of the Council.

John Greenough  
*Chairman*

#### REPORT OF THE TREASURER FOR 1915

The report of the Treasurer, Mr. Henry Parish, Jr., was read:			
On January 1, 1915, there was on hand in general account,			
a balance of.....			\$1,032.43
(of which \$375 was capital awaiting investment.)			
During the year there have been received from fellowship dues,			
sales of publications, interest on investments, and dona-			
tions applied to general purposes.....	\$42,283.40		
Donations for other and special purposes.....	\$6,263.50		
Brought forward from 1914.....	4,939.23	11,202.73	53,486.13
Legacy .....			10,000.00
			<u>\$64,518.56</u>
There have been expended for salaries, meetings,			
purchase of books and maps, library, publica-			
tions, house expenses, insurance, postage.....	\$46,096.00		
For special purposes, Memorial Volume, etc.....	4,420.54	50,516.54	
Investment of legacy and capital above.....		10,375.00	60,891.54
Cash in general account.....	\$1,257.43		
Unexpended donations .....	2,369.59		\$3,627.02

The reports of the Council and the Treasurer were approved and ordered on file.

#### REPORT OF THE SPECIAL COMMITTEE

The Report of the Special Committee charged with the duty of selecting candidates for the offices to be filled was presented and read:

NEW YORK, January 25, 1916.

The Special Committee appointed December 16, 1915, to nominate and invite suitable persons to fill vacancies in the offices of the Society existing at the date of its annual



days of early settlement, is very considerable. Unhappily, careless use and forest fires have already wasted much. It is estimated that 1,000,000 acres have been lost annually from the latter cause during the past twenty years. Ten years ago quantities of timber had to be imported into the Yukon mining camps from Puget Sound. On the coast, too, timber is still imported, but this will not be permanent. At present the high cost of labor and the abnormally low price of southern lumber enable the Washington mills to compete successfully. The Tongass forests must develop in time. Besides their value in timber content, they are easily accessible—the shore line has an extent of 12,000 miles—and there is abundant water power for running saw or pulp mills. Under proper management they can be made to yield not less than 500 to 600 million feet of timber per annum. Under public ownership they are open to development and even now supply a variety of local requirements, such as docks, mines, canneries, agricultural settlements.

**Potash Resources of the United States.** The war has enveloped the future of the potash industry in a cloud of speculation. One fact, however, has been clearly proved—that the United States possesses raw material in sufficient quantity to much more than supply its own requirements and that no insuperable physical obstacle prevents production of the commercial product. The commercial practicability of production is, however, another matter, and it remains unsettled (*Possible Sources of Potash in America*, by Frank K. Cameron, *Journ. of the Franklin Inst.*, Vol. 180, 1915, No. 6, pp. 641-651). The country has four possible sources of potash. Large deposits of potash feldspars occurring in various localities are known to contain 10 per cent or more potash, but it has not yet been proved that the cost of extracting the raw material or of refining the product is not prohibitive. The widely distributed potassium salts of desert basins are in general too little concentrated for practical working. There is one known possible exception. A “miner’s chance” is in the process of exploitation at Searle’s Lake, San Bernardino County, California. Below the mud surface of the “lake” is a layer of brine with potassium chloride yielding 5 to 6 per cent potash. Ordinary crystallization methods have failed to obtain a sufficiently pure product from the mixture of soluble salts, but the company now engaged in the exploitation is working on new methods of separation. Other difficulties lie in the way of utilizing the alunite deposits of southern Utah—transportation problems and lack of local markets for the by-products that decide the balance between profit and loss. At the present moment two companies are in operation and may succeed on a small scale. The most hopeful prospect rests with the giant kelps of the Pacific Coast. The sun-dried alga contains 16 per cent potash and is an excellent fertilizer. The plant can be harvested on a vast scale, far exceeding any home requirements, but the technology of the drying process has not yet been worked out in a practical way. Another deterrent is also likely to arise. The beds of algæ lie within the limits of the state, and no satisfactory legislation exists in regard to them.

**Population Controls in Montana.** White settlement in Montana was first controlled by the waterways. Following the Lewis and Clarke expedition fur trading posts were established on the Missouri and Yellowstone Rivers, whence furs went out and supplies came in from St. Louis,—in the early days an upstream journey of six months. With the coming of the steamboat in 1829 river traffic expanded rapidly, reaching a maximum after the discovery of gold, 1861-1862, and before the arrival of the railroad, 1883. The first control of the more permanent settlement was the mineral wealth of the mountains. In 1870 about 75 per cent of the population was living in four mining counties occupying less than 9 per cent of the total area of the state. Conclusion of the Indian wars in the later seventies opened up the eastern plains to cattle ranchers and sheep men, whose occupation was largely determined by the limited water supply. Profound changes of distribution commenced with the new century and the discovery of the dry-farming possibilities of the bench lands of the east. Today the value of Montana’s agricultural products exceeds that of her minerals. Railroads that formerly served only the mining districts are now seeking the most favorable agricultural locations. A rise of the newest control—manufacturing—is seen in the increasing city population. According to the 1910 census six cities had a population of over 10,000. (*Geographic Influences Affecting Distribution of Population and Character of Industries in Montana* by O. A. Freeman, *Inter-Mountain Educator*, Jan., 1916.)

**Glaciation of the San Juan Mountains, Colorado.** For some years Professor W. W. Atwood of Harvard University has been studying the San Juan Mountains region in southwestern Colorado. He now presents (*Eocene Glacial Deposits in Southwestern Colorado*, *U. S. Geol. Surv. Prof. Paper 95-B*, pp. 13-26) some conclusions of importance concerning the physical geography of the region in relation to early Tertiary glacial

deposits discovered in the foothill belt at the northwest base of the massif. In the discussion of the origin of glacial deposits there is published the following diagrammatic cross-section which summarizes the physical history. It is concluded that during the dissection of the early San Juan Mountains (the uppermost of the three shown in the diagram) ice formed in the higher valleys and descended to bordering lowlands. After the disappearance of the early Tertiary ice a peneplain was developed, bordered on the

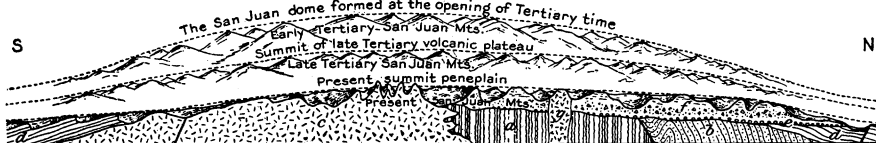


FIG. 1—Diagrammatic cross section showing the physiographic evolution of the San Juan region since the beginning of Tertiary time. *a*, Pre-Cambrian schist and gneiss; *b*, Algonkian quartzites; *c*, Pre-Cambrian granitic intrusion; *d*, Paleozoic and Mesozoic rocks; *e*, Ridgway till and Telluride conglomerate; *f*, middle and late Tertiary volcanics; *g*, Tertiary intrusives.

Reproduced from FIG. 11, *U. S. Geol. Surv. Prof. Paper 95-B*.

west by mountains. Both mountains and peneplain were affected on the one hand by erosion and on the other by vulcanism, the latter producing a great volcanic plateau. Further dissection followed the warping and doming of the summit peneplain and produced, with glacial agents, the present San Juan Mountains. It is further concluded that continuing uplift stimulated valley erosion and resulted in the cutting of the present deep canyons below the level of the broad glacial troughs.

**Irrigation and Rice Cultivation in Texas.** A few years ago Texas was the foremost rice-producing state of the Union. This was the boom period that followed the introduction of improved cultivation methods in 1895. Ravages of the boll weevil in the cotton fields helped to turn attention towards rice-growing, and the plentiful supply of good cheap land encouraged extensive cultivation. From the Louisiana boundary to the River Guadalupe the black clayey soil of the coastal plain is eminently suited to rice-growing: but profit from rice as a frontier crop could not be of long duration. Impoverishment of the rich soil, scarcity and high cost of labor, with other economic restrictions, necessitated the adoption of intensive methods. The problem of successful rice production has essentially resolved itself into the problem of scientific irrigation (C. G. Haskell: *Irrigation of Rice on the Coastal Prairies of Texas*, *Texas Dept. of Agriculture Bull. No. 43*, pp. 88-116). In many respects the Texan rice zone is well adapted to irrigation. The surface of the land is level and the subsoil impervious. The considerable rainfall (averaging 46 inches per annum, with 60 per cent in the growing season), the large amount of water surface, and the height of the water table provide or conserve a very fair water supply. Moreover the length of the growing season—273 days—permits an extended period of planting and hence a more equitable use of the water. Well construction is practicable throughout much of the region. Near the Gulf, water-bearing layers are struck at little depth. Deep wells, indeed, cannot be employed in the coastal fringe, for they tap salt water, which, even in small amounts, is harmful to the young plant. A similar disadvantage may be encountered in stream irrigation near the shore, when a low stage of the river water causes inflow from the sea. Altogether wells supply about 17 per cent of the irrigation water, a smaller proportion than during the early days of more isolated settlements. The well source is advantageous in times of adequate and uniformly distributed rainfall, otherwise canal irrigation is more economical. Irrigation of this latter type affords great scope for development along co-operative lines. Economies can be effected by the use of common arteries and pumping apparatus. Cheap and efficient running of the latter is particularly desirable. One of the factors determinant of cost is the accessibility to fuel resources. In the vicinity of the oil-fields a cheap fuel is available. Smaller and more isolated plants are frequently able to use wood from the forested borders of the prairie lands. The question of water control is one of the most interesting. About one-third of the water used is controlled by the users; a greater proportion is obtained by cash rental and the rest by payment in kind—either a certain share, usually one-fifth, or a fixed amount of the crop. In a few cases the farmer is a *métayer* paying a share of the crop for land, water, and seed. Distribution of the rented water is regulated by levee riders on whose honesty and discretion depends much of the smooth and effectual working of the system. Occasionally echoes may be heard of the dissensions that are as old as

the beginnings of irrigation, dissensions that vexed the earliest irrigators in Babylonia and today still perpetuate constant discord along the 1,600-mile stretch of coast that forms the western desert of South America.

**Mexican Land Grants in California.** The history of old Spanish grants in United States territory has always been replete with judicial uncertainties. An account of grants bestowed by Mexico in California is given by C. C. Baker in the 1914 issue of the *Annual Publications of the Historical Society of Southern California* (Vol. 9, Part 3, pp. 236-243). From this it is gathered that although the American government did not intend to annul the grants of land made by Mexico, a study of the United States patents covering the old grants reveals occasional imperfections in the titles to land properties.

Altogether seventy-eight patents were issued, covering an area of 1,419,475 acres. Some were of considerable dimensions. The San Fernando Mission estate comprised 116,858 acres of land. The Simi grant followed with 113,009 acres. Nine patents covered 40,000 acres each. The names of some of these grants are perpetuated in the towns. San Pedro is an instance in point. The beach cities of Santa Monica and Redondo are others. It is interesting to note that the missions retained but little of the vast tracts they once claimed. Such parceling of property has steadily taken place since the beginning of American sovereignty over the region.

**The War and Cuban Commerce.** While eastern Cuba is enjoying a period of prosperity, the western part of the island is plunged into such serious financial distress that congress has been compelled to vote a considerable sum for relief amongst the working people and has offered free railway transportation to conduct labor from west to east (The Cuban Tobacco Industry, *South Amer. Journ.*, Vol. 79, No. 23, Dec. 4, 1915). Eastern Cuba produces sugar. The diminution in supply of the European product has enabled her to dispose of the excellent 1914-15 crop at highly remunerative prices. On the tobacco industry of the western section of Cuba the war has had a contrary effect. Increased taxation on the import of this commodity into the United Kingdom has reduced the demand from Cuba's second largest customer. More recently the British prohibitions on imports—including tobacco—which became effective March 1, have produced the gravest apprehension among the tobacco producers of the West Indies, especially Cuba.

#### SOUTH AMERICA

**Economic Regions of South America.** A recent publication of the Bureau of Foreign and Domestic Commerce of the Department of Commerce entitled "Banking Opportunities in South America" by William H. Lough (*Special Agent Series, No. 106*), though devoted primarily to banking problems, contains some facts of interest to geographers. The author, by way of introduction to his report, proceeds to show that, economically, South America may be divided into four rather distinct regions. The first is the Amazon basin, comprising most of northern Brazil and the eastern lowlands of Peru and Bolivia—the regions of tropical forests. Next to rubber, sugar and cacao are the main products. The second region includes the River Plate basin, southern Brazil, and northern Argentina. This region he designates "the fertile, prosperous, and partly developed agricultural section of South America." The northern portion of this division contains the great coffee-producing section of Brazil, while the River Plate valley is one of the great sources of supply of live stock and grain. A third region embraces the west coast, comprising Chile, western Bolivia, Peru, and Ecuador. Minerals, notably copper, tin, and nitrates, are the chief products, although there are fertile sections (not along the coast) whence are obtained grain, cattle, and fruit in the southern part of the region, and cotton, sugar, and cacao in the warmer northern sections. The fourth region comprises the north coast—Colombia and Venezuela, producing coffee, sugar, cacao, tobacco, and tropical fruits, and containing, in the interior mountainous section, important mineral resources. If a fifth region were to be marked off, he would make it by subtracting from the second region its northern portion—the great coffee-producing section of Brazil. "Each one of these four regions," says Mr. Lough, "has an economic life of its own. Their products, their shipping routes and trade connections, and their populations are quite distinct. It is probably safe to say that each of the four regions has much closer relations with the United States and Europe than with any of the other three regions."

AVARD L. BISHOP.

**The Economic Development of São Paulo.** Nearly a decade ago, in an endeavor to remedy the results of the overproduction of its staple the state of São Paulo undertook an extraordinary fiscal experiment,—the valorization of coffee (*cf.* "Brazil's Failure

to Control the Price of Coffee," *Bull. Amer. Geogr. Soc.*, Vol. 41, 1909, pp. 220-222). The loans contracted for that purpose in 1907 have now been amortized, but it is anticipated that the supertax of 5 cents per sack on exported coffee levied for the purpose will be continued (*Suppl. to Commerce Repts.*, No. 40d, Nov. 16, 1915). Coffee still forms 99 per cent of the foreign exports of the state, and it is estimated that the supertax will contribute over half the total revenue. This progressive state is continuing its policy of encouragement of diversified production. The needs of a growing population and the influence of the state department of agriculture have increased the area planted to crops, especially corn. Wheat, however, has not yet proved a success. A notable advance has also been made in the meat-packing business.

**Rubber in Argentina.** A variety of the rubber plant occurring in the department of Orán in northern Argentina is described by C. Spegazzini in the July-August, 1914, issue of the *Anales de la Sociedad Científica Argentina*. It is locally known as *verdenasco* or *zarzaparrilla blanca silvestre*. Its botanical name is *Smilax campestris* Griseb.

The rubber yielded by this plant differs from the familiar product by a greater degree of solubility in ethyl alcohol. It is described as amorphous, inodorous, without marked taste, and highly elastic. It is insoluble in and impermeable to water. On the other hand, it melts readily in solutions of carbonic sulphide, benzene, or chloroform. The product is characterized by rapid vulcanization in the presence of a sulphurous solution. When burned it emits the characteristic odor of rubber.

## EUROPE

**Northern Outlets of the Mediterranean Basin as Historical Factors.** An enlightening contribution to the history of the Mediterranean basin is presented by Miss Semple's studies of its northern breaches in the *Annals of the Association of American Geographers* (Vol. 5, 1915, pp. 27-59). The favored lands surrounding this sea were cut off from the rest of the world during prehistoric ages by mountain or desert barriers. Their early inhabitants were left to themselves. Eventually contact with northern foreigners was brought about through the existence of four important breaches in the northern rampart of uplifts. From east to west Miss Semple designates them as the Bosphorus-Hellespont breach, the Morava-Vardar furrow, the passes of the Julian Alps and the Karst, and finally the Rhone Valley breach. They are the main avenues of intercourse between northern and southern Europe. Migrations, trade, or military expeditions have flowed through these channels.

The importance of Miss Semple's researches is illustrated in the case of the Rhone basin gap. Lying between the pile of primary rocks of the Massif Central and the Tertiary folds of the Alps, it forms, together with the valley of the Saône, a corridor which links the Mediterranean to the ancient land of Burgundy. The breach branches out here, fork-like, into the valley of the Seine and, through the Belfort gap, into that of the Rhine. Thus it became the avenue through which blond northerners passed among southern brunettes. At the time of Roman world-colonization its low-lying territory allowed the civilization of Rome to penetrate into Gaul. Through the Mediterranean at its southern end and the Seine emptying into the Channel at its northern extremity it conveyed Mediterranean culture into the very heart of England.

In the same way the function of the remaining three breaches has been that of bringing north and south together. Through the Bosphorus-Hellespont gap the life of Russia's southwestern plains was drawn, albeit imperfectly, into Mediterranean activity, while countercurrents of southern thought traveled slowly northward. The penetrability of orographic barriers to civilization is made clear by such detailed description. It is to be hoped that a study of the southern breaches from the same pen may soon be available.

## AFRICA

**Condition of the "Cape-to-Cairo" Route.** The route of the "Cape-to-Cairo" transportation system has been surveyed in its entirety and is actually short of completion by only three comparatively short links (*Suppl. to Commerce Repts.*, Ann. Series, 1915, No. 64a). On the two unconstructed railroad links, both in the Congo, work has been suspended since the outbreak of the war. One of 155 miles from Tshilongo to Bukama is required to put the latter place in rail communication with Cape Town, distant 2,620 miles. From Bukama, river navigation, with two short railroad sections avoiding the rapids between Kongolo and Kindu and between Ponthierville and Stanleyville rapids, extends to Stanleyville and the beginning of the second unbuild section of about 548 miles to Mahagi on the western shore of Albert Nyanza. From thence Uganda Government steamers will be operated to Khartum, in which section the only hindrance to navigation is the rapids between Rejaf and Dufle. This will be removed by the



construction of a lock instead of by the railroad line at first proposed. From Khartum Sudan Government trains and steamers and the Egyptian Railway complete the route to Cairo and Alexandria. The transcontinental route across tropical Africa from east to west was opened during the early part of 1915 (see *Bull. Amer. Geogr. Soc.*, Vol. 47, 1915, pp. 449-450 and p. 959) but is now closed on account of military necessities.

**Effect of the War on South African Trade.** According to Laite's Commercial Blue Book for South Africa, 1915 (pp. 181 and 321), the war has had a remarkable effect on the reduction of exports. The reduction in value of exports for the first seven months of the war amounted to \$102,500,000. This was largely due to the fact that it was not deemed safe to ship raw gold, diamonds, and wool, though the inconvenience, as far as gold was concerned, was nullified by an arrangement with the Bank of England, which negotiated bills on the same basis as though gold had been shipped. Another element in the reduced exports was the complete collapse in the demand for ostrich feathers, a trade that was weakening before the war and was paralyzed when hostilities began. Thus South Africa stands out with greater prominence than ever as a distinct economic unit, in many respects unlike the temperate regions of South America or Australia. Their exports are still in demand, for they belong almost exclusively to the class of necessities for Europeans. (See also the articles by A. L. Bishop and Mark Jefferson on the effect of the war on world and on American trade in the *Bull. Amer. Geogr. Soc.*, Vol. 47, 1915, pp. 641-651, and the article in this number on "Trade Movements and the War.")

## ASIA

**Land Routes to India.** As a consequence of the campaign being carried on in Mesopotamia, the possibility of a Turco-German drive to India is suggested by Talcott Williams under the caption "Can Germany go to India?" in the January number of the *Review of Reviews*. The writer takes into account the several routes to India and points to the main caravan route through Persia and Baluchistan as a likely path for an invading force. For this he has assumed that the Bagdad line is completed and, this being insufficient, he further assumes that the building of branch lines to Sulemanieh and Hanikin are being pushed vigorously.

Perhaps the writer is over sanguine in his estimation of the rapidity with which these Turkish railroads can be built. His reproduction of our Society's map of Turkish railroads published in the December issue of the *Bulletin* shows the Bagdad line in operation, although the original merely indicated that it was under construction. Mr. Williams' assumption is based on news conveyed to him by a nameless wanderer from Mosul. Nevertheless, he would have been much nearer the truth had he chosen to abide by the Society's carefully prepared map, which was brought up to date of December 1, 1915, and not merely to August 1, 1914, as he has stated. A casual reference to the Gaza line, shown completed to the Egyptian border, would have indicated this.

But supposing the line to be completed, although it is doubtful whether 1916 will witness the event, the transportation of a German or Turkish army to India over it makes better reading than practical working. Thirteen hundred miles of some of the most sterile land in the world separate Mesopotamia from India. Far from being a causeway between these two fluviatile regions, the plateau of Iran would probably be the grave of an expeditionary force marching eastwards. Its central caravan route is merely a narrow strip in which fresh water is occasionally met, though not in the quantities required by a modern force on the march. It may be negotiated satisfactorily, yet ever arduously, by a string of thirty-odd camels and their attendants. But to send an army over this route is another undertaking. The real danger to India, if any, lies in native uprising rather than in land attack by German or Turkish forces.

**Opening of Pukow Harbor.** Pukow, a Chinese seaport on the north bank of the Yangtze River, directly across from the city of Nanking and 205 miles from Shanghai, has been opened to foreign residence and trade by the Chinese Government, according to information from Consul J. Paul Jameson in *Commerce Reports* for January 17, 1916. The port lies in the province of Kiangsu and consists of the three small islets of Yung Seng Chow, Chin Foo Chow, and Liu Chow. It has the advantage of being accessible at all times of the year and may on this account prove to be a serious rival of Hankow's traffic.

A large amount of freight is expected to reach Pukow through the Tientsin-Pukow railway, which traverses the fertile agricultural districts of Anhui and southern Kiangsu, the mining and farming districts of northern Kiangsu and Shantung, and the cotton-raising districts of Shantung and Chihli provinces. The productive northwest region of China is also tapped by the line through its connection with the Peking-Hankow railroad.

**Irrigation Societies in the Philippines.** An interesting condition of primitive societies and one illustrating the similarity of human institutions in widely separated regions is exemplified by the organization of irrigators in some of the Philippine provinces, as described in a recent paper by Emerson B. Christie (*Notes on Irrigation and Co-operative Irrigation in Ilocos Norte, Philippine Journ. of Sci.: Section D*, Vol. 9, 1914, No. 2, pp. 99-113). Here are considerable areas of land under irrigation, mainly devoted to the growing of rice. The works, though effective, are crudely constructed, being the result of efforts continued through generations. Water is diverted from the streams usually by low temporary dams of bamboo and rock. The ditches as a rule are well constructed and show good maintenance. Water is conducted by gravity, few, if any, mechanical devices being in use. The people who built and operated these works can rarely read and write, but they have developed forms of organizations which are quite complicated and, at the same time, effective. The agreements recite certain definite understandings and are drawn up and signed by each individual water user, usually by a cross.

The interesting point is that these agreements among semi-civilized people are similar to those which have existed for several generations in the southwestern part of the United States among the town-dwelling Indians and the neighboring Mexicans who have settled along the Rio Grande and its tributaries, and other similarly situated rivers. The documents recite the conditions which are to be fulfilled and the penalties for evasion of duty by any one of the members of the community. A chief is chosen each year by popular vote, and his orders with respect to the operation and maintenance of the irrigation system are to be obeyed. Each person is to appear for work at the designated time or he will be fined for failure to perform his part. The penalties, while not extreme, are adequate to insure fairness and bring about a proper sharing of the difficulties as well as of the advantages. The existence of such understandings in widely separated parts of the world and the fact that they have been in force from time immemorial demonstrates the practicability of effective community work among these people of similar education and experience. It is also interesting to note that, as in more highly developed societies, there are ever-present dangers of one man of unusual energy or ability dominating in the division of benefits. Provisions are made to meet these conditions; for example, the elected chief is forbidden to enter into contracts without first submitting the proposition to a meeting of the society. Another provision forbids a member alienating his share without the consent of his fellow-members. In these societies as elsewhere the chief difficulty arises in the protection of the rights of the weaker members and in the fair distribution of the water to all entitled to it. The favored safeguard seems to be in the annual choice of a chief and in the provisions which in effect require a full publicity as to all actions taken.

F. H. NEWELL.

#### AUSTRALASIA AND OCEANIA

**Physiognomy of Western Australia.** A great part of the state of Western Australia, comprising an area equal to that of the United States east of the Mississippi River, is a characteristically arid land. Its general surface is a vast, even, slightly tilted, and recently uplifted plain, the high points of which are 4,000 feet above sea-level. A quite notable feature of this desert tableland is the remnant of an old peneplain which still persists, even near the sea, where the climate is rather moist. In the interior the old peneplained surface seems to have been all but completely obliterated by the work of the new cycle of erosion. According to the conclusions recently drawn by Mr. J. T. Jutson (*An Outline of the Physiographical Geology of Western Australia, W. Austr. Geol. Surv. Bull. 61*, Perth, 1914), after an exhaustive study of this country, the present relief expression of the region is mainly, if not solely due to wind erosion, and a new plains-level is at the present time being developed at an angle to the old one.

It thus appears that the arid great plateau of Western Australia, like the high plains of the South African veldt and the Mexican tableland, is a vast area wherein regional leveling and lowering is now going on without any near approach to baseleveling. Nowhere else on the face of the globe are the relative efficiencies of the different erosional processes displayed in so remarkable a manner so near together as in Western Australia. Marine planation, stream corrosion, and general wind-scour are vigorously at work upon the destruction of the old tilted peneplain. Their potencies appear to be inverse to the order mentioned.

CHARLES R. KEYES.

**The Latest Eruption of Mauna Loa.** Further notes on the outbreak of Mauna Loa from November, 1914, to January, 1915, are given by Dr. T. A. Jaggar, Jr., in the *American Journal of Science* (Vol. 40, No. 240, Dec., 1915, pp. 621-640). The events of the period of seismic prelude as well as the observations taken during the outbreak

are recorded. The activity of the volcano is considered a preliminary summit ebullition of the same type as that which preceded former eruptions. The case of the great Hilo flow of 1880-81, which came as a sequel to the eruptive period of May, 1880, is cited together with other occurrences of approximately similar periodicity.

The relation of this volcano to Kilauea still awaits determination. It has been observed in general that the subsidence of Kilauea lava to smoky depths corresponds to a paroxysmal period at Mauna Loa. A complicated system of interdependence between the two volcanoes may possibly manifest itself by alternations of eruption. The rise of Kilauea corresponding to the Mauna Loa outbreak may be interpreted by this assumption. The possible existence of a subterranean connection is found in the occurrence of gas-impelled fountains of lava foam detected before the rise of the lava column from the Mauna Loa vent 10,000 feet above the level of the mouth of Kilauea.

No manifestations of activity after the eruption were noted from January to June, 1915. After the summer solstice, however, thin smoke was detected occasionally. A slight rise of Kilauea lava was also observed in June. It is not to be expected that lava will flow from the flanks of the volcano for some years.

### PHYSICAL GEOGRAPHY

**Sunspots and Atmospheric Pressure.** Von Hann, Blanford, and Fritz have discussed the effect of sunspots on atmospheric pressure, with generally rather unsatisfactory results. So far as India is concerned, Blanford did present some fairly good evidence tending to show that at times of sunspot maxima the pressure in the Indo-Malayan region is high, while that in European Russia and western Siberia is low. Dr. Gilbert T. Walker, Director-General of Indian Observatories, discusses sunspots and pressure in his sixth paper on "Correlation in Seasonal Variations of Weather" (*Mem. Indian Meteorol. Dept.*, Vol. 21, Pt. 12, 1915). The data relate mostly to the years since 1850, and the correlation coefficients are charted. Comparison of this chart with the corresponding one, previously published by Doctor Walker, for sunspots and rainfall, shows the general tendency of the pressure coefficients to be of opposite sign to the rainfall coefficients. It is inferred that the variations of pressure and rainfall are to a large extent dominated by the same cause and are comparatively little affected by variations of temperature. Further, the relation between sunspots and temperature seems to be brought about rather by excess of humidity in the air, at any rate in its higher levels, than by excess of rain. Doctor Walker regards it as premature to discuss in detail the causes that are at work in the relation of sunspots and pressure until the data of certain other elements have been analyzed. Future publications dealing with Doctor Walker's further investigations of this highly important subject will be awaited with interest.

R. DEC. WARD.

### HUMAN GEOGRAPHY

**Geographic Influences in the Field of Science.** In a presidential address delivered at the eleventh annual meeting of the Association of American Geographers and reproduced as the leading contribution to the fifth volume of the Association's *Annals*, Prof. A. P. Brigham has marshaled a host of facts which bring out the all-pervading nature of geography. His views may be summed up by stating that before looking into any form of activity we should look at the land in which it is manifested. Geography thus becomes the science of foundations. It is to be regarded as a parent-science rather than a sister-science.

Treating of geography and American character, Professor Brigham points to the necessity of taking ancestral environment into account. Thus the New Englander is, to a certain degree, the product of the surroundings in which his forebears moved prior to their emigration to America. The spirit of Jute or of Viking rovers enters today into the character of many a Vermont farmer or British Columbia rancher. The extent to which such prenatal influences prevail in the individual cannot be determined. But the past lives in the present, and this is the triumph of will over unthinking nature. The Puritan on the rocky northeastern coast of the United States did not succumb to enviroing inhospitality but brought long inherited energy into action upon his new American home.

The exploitation of the field of regional geography is strongly urged. This is the day of intensive studies. The United States' field is full of possibilities. The sowing of a healthy seed was begun four centuries ago, and the harvest season cannot be much delayed. Physiographic and historical material abounds for the eastern United States. The Coastal Plain, the Piedmont, or the Great Appalachian Valley, are topics suggested. The name of every state in the Union ought to be placed on the list. Our great river valleys, a unit like Long Island, likewise lend themselves admirably to this treatment.

The paper is notable for its breadth of scholarship, its closely organized form, and its sanity and suggestiveness. It would be a great gain for geography if there were general emulation of the author's charming literary style. The only criticism of the paper grows out of the too close adherence in the opening paragraphs to theories of evolution now superseded or at least strongly modified by the recent anthropological work of Ripley, Elliot Smith, and Osborn.

**Weather and Human Health and Activity.** More and more attention is being paid to the relations between the weather and man's mental and physical condition. The medical profession has long recognized the importance of this matter, but it is only in recent years that careful statistical inquiries have been made, by meteorologists and others. An investigation of this character has lately been carried out, with the assistance of the Vienna Academy of Sciences, by Drs. Wilhelm Schmidt and Ernst Brezina (*Sitzungsber. Wien. Akad. Wiss.: Math.-naturwiss. Kl.*, Vol. 123, Sect. III, 1914, pp. 209-291). The authors point out the need of caution in any such study,—the danger of basing conclusions on occasional correspondence of what seems like effect and cause, and the importance of realizing that variations of some perhaps neglected or even unknown control may be the real cause of the phenomena with which we are dealing. The material used in the present investigation was the work of certain employees in the Census Office and of fifty classes of school children, and the statistics of epileptic attacks in a certain institution—all of these in Vienna. These reasonably abundant and comparable data were all carefully collected and "accidental" conditions allowed for, so far as possible. The meteorological data, which were probably the most complete yet used in any such investigation, were obtained from the official records of the Vienna observatory.

The most important conclusions are as follows: No single meteorological element included in the investigation has a preponderating influence on man's health and activity. Moderate intellectual activity seems at its best when the pressure is constant. Short and rapid pressure changes (4-20 minutes) of considerable amplitude are associated with unfavorable conditions of intellectual work, and with epileptic attacks. Intellectual work is diminished by high temperatures (plus temperature departures lasting two or three days). The ozone content of the air seems to have practically no effects, and wind has only very slight effects. Clerks and school children do their poorest work under weather conditions which prevail when the pressure is falling locally and rising in the west. The opposite relation holds for epileptics.

R. DEC. WARD.

#### GEOGRAPHICAL NEWS

**Organization of the Ecological Society of America.** A meeting was held at Columbus, Ohio, on December 28th, 1915, at which it was decided to organize the Ecological Society of America. Dr. Victor E. Shelford, of the University of Illinois, is president of the new society, and Professor W. M. Wheeler, of Harvard University, is vice-president. Steps had been taken a year before to secure the views of animal and plant ecologists with regard to the formation of such a society, and the result was the enrollment of one hundred charter members and the rapid acquisition of over one hundred additional members in the fortnight following the organization meeting. The society will hold an annual session for the reading of papers and will organize field meetings from time to time in different parts of the country. The first regular meeting will be held in New York during Convocation Week of the present year. Field meetings have already been arranged to take place in the vicinity of Chicago in June, and at San Diego in August. The interests and activities of this society will be of the broadest character, embracing every phase of the relation of organisms to their environmental conditions, including the study of animal and plant geography. Those who are desirous of becoming members of the Ecological Society should communicate with the secretary-treasurer, Dr. Forrest Shreve, Tucson, Arizona.

**The Revue de Géographie Annuelle.** Back numbers of this valuable publication have been recently added to the Society's library, and the entire set is now available for consultation. The last volume issued is the seventh in the series. It contains papers published in 1913. Some might more appropriately be called monographs than articles. Volume 7 in particular contains three long and instructive studies bearing the following titles: "Le Commonwealth d'Australie," "Les Dépressions Continentales et le Climat du Tonkin," and "La Basse Normandie." Volume 5 (1911) is of particular interest to American students because it contains a paper on the economic geography of Cuba. Volume 6 (1912) contains a French translation of Erland Nordenskiöld's detailed ethnographic study of the Indians of the Argentine and Bolivian Chaco (German edition listed in the September, 1915, *Bull. Amer. Geogr. Soc.*, p. 717).

**Ten Years' Index to the Geographische Zeitschrift.** This well-known Leipzig publication has just issued its "Register zu den Jahrgängen 1905-1914" prepared by Dr. Daniel Häberle. It is a systematic index, covering 160 pages, to the contents of the *Zeitschrift* for the ten years ending with Volume 20. Professor Franz Thorbecke prepared the index for the first ten years, and the two volumes make the entire content of this notable periodical easily available for all geographical workers.

## PERSONAL

MR. WILL C. BARNES, of the U. S. Forest Service, spoke on February 11 before the Geographic Society of Chicago on "The Life of a Forest Ranger."

CAPTAIN JOSEPH E. BERNIER, according to press despatches from Quebec dated January 16, is planning another expedition to the Canadian Arctic. He proposes to start in July on his own ship, the *Guide*, and to be gone for two years. Captain Bernier will be remembered for his previous explorations in the American Arctic archipelago,—of interest geographically, because of the original surveys of the uncharted northwestern end of Baffin Island, and politically, because he was the officer who carried out the formal annexation by Canada of the whole archipelago.

PROFESSOR FRANZ BOAS, of Columbia University, spoke on January 24 before the New York Academy of Sciences on "General Ethnological Notes from Porto Rico."

MR. ANTHONY FIALA gave an illustrated lecture on January 14 before the Geographic Society of Chicago entitled "Through the Brazilian Jungles with Colonel Roosevelt." Mr. Fiala, it will be remembered, was a member of one of the three parties into which the Roosevelt-Rondon Expedition separated to reach the Amazon. His route followed the Papagaio, Jurueña, and Tapajoz Rivers (see map in this number on page 171).

CAPTAIN GRANVILLE FORTESCUE lectured on February 2 before the Geographical Society of Philadelphia on "The Dardanelles and the European War."

PROFESSOR A. W. GRABAU, of Columbia University, gave a paper on January 3 before the New York Academy of Sciences on "Some Parallelisms in the Geology of Western Europe and America."

PROFESSOR D. W. JOHNSON, of Columbia University, spoke on January 3 before the New York Academy of Sciences on "The Strategic Value of Landforms in the Great Russian Retreat." The lecture discussed substantially the same topics as Professor Johnson's paper in the February *Review*. On February 11 Professor Johnson addressed the members of the United State Naval War College at Newport, R. I., and, a week later, the students of Mount Holyoke College on "Topographic Features of Europe as a Factor in the War."

DR. FRANK E. LUTZ, of the American Museum of Natural History, spoke on February 15 before the New York Entomological Society on "Centers of Dispersal and Their Bearing on the Present Distribution of Animals."

MR. NORMAN TAYLOR, of the Brooklyn Botanic Garden, is giving a course on phyto-geography at that institution. The course deals with plant distribution over the earth. Prerequisites are courses in plant ecology and geology and a good general knowledge of climatology and systematic botany.

PROFESSOR WILLIAM I. THOMAS, of the University of Chicago, spoke on January 28 before the Geographic Society of Chicago on "The Comparative Mental and Moral Worth of Races."

MR. EUGENE VAN CLEEF, of the Duluth (Minn.) State Normal School, spoke on "Our Debt to Climate" at a geography round table at a meeting of the Northeastern Minnesota Educational Association on February 18.

DR. LUCY L. W. WILSON, of the Philadelphia Normal School, on January 19 gave an illustrated lecture before the Geographical Society of Philadelphia, entitled "Climate and Prehistoric Man as Revealed in Recent Excavations in New Mexico."

## OBITUARY

PROFESSOR EUGENE W. HILGARD died on January 8 at the age of 83. Since 1904 he had been emeritus professor of agriculture at the University of California. The breadth of treatment and attention to causal relationship resulting from Professor Hilgard's equal proficiency in geology and agriculture gave his work a distinctly geographic character. The fundamental "Report on Cotton Production in the United States," published in 1884 by the Tenth Census, was prepared under his direction; he himself contributed the general discussion of cotton production and the sections devoted to Louisiana and Mississippi, each preceded by a summary of the physical geography